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10/782,080	02/19/2004	Russell Hitchcock	R. HITCHCOCK 1-4-1-7	4766
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HITT GAINES, PC LSI Corporation PO BOX 832570 RICHARDSON, TX 75083			EXAMINER RUTTEN, JAMES D	
			ART UNIT 2192	PAPER NUMBER
			NOTIFICATION DATE 10/18/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@hittgaines.com

## Office Action Summary

Application No.

10/782,080

Applicant(s)

HITCHCOCK ET AL.

Examiner

J. Derek Rutten

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2007.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-20 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This action is in response to Applicant's submission filed 8/10/07, responding to the 4/11/07 Office action which detailed the rejection of claims 1-20. Claims 1 and 3 have been amended. Claims 1-20 remain pending in the application and have been fully considered by the examiner.

#### ***Response to Arguments/Amendments***

2. Applicants' amendment to claim 3 has obviated the objection to the claim, which has therefore been withdrawn.

3. The terminal disclaimer filed on 8/10/07 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 10/612,097 has been reviewed and is accepted. The terminal disclaimer has been recorded.

4. In section III at the bottom of page 7 filed 8/10/07, Applicants essentially argue that the amendment to claim 1 (i.e. "computer-implemented condition management callback system") has clarified the claim and is now in compliance with the requirements of § 101. This argument is not persuasive since the elements of the system still appear to be software elements per se, regardless of whether or not it is a computer-implemented system. A system that is comprised only of software elements can only be interpreted as software per se, which is not statutory. In contrast, claim 5 recites a register structure that is part of a processor, which is statutory.

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5. Applicants' arguments on pages 8 and 9 filed 8/10/07 have been fully considered but they are not persuasive for the reasons set forth below.

On page 8 with respect to the rejection of claims 1-3, 7-9, 11-13, and 17-19 under 35 U.S.C. § 102(b), Applicants essentially argue that the prior art of record, US Patent 5,568,644 to Nelson et al. discloses traversing a hierarchical Interrupt Source Tree (IST) using an interrupt service routine (ISR) to determine which node caused an interrupt, and thus does not disclose "another structure," i.e. a condition management structure, to traverse a hierarchical register consolidation structure, as recited in claims 1 and 11. However, Applicants' interpretation is respectfully traversed. Nelson column 4 line 66 – column 5 line 5 discloses:

At step 200, an interrupt is generated and **the interrupt dispatching process or interrupt engine** begins processing at the root node of the **hierarchical IST** by making the root node the current evaluation node, step 205. **The ISR** of the current evaluation node is then invoked, step 210. Each leaf node provides a device handler ISR to service a device. [emphasis added]

Nelson uses an interrupt engine to traverse the IST, then uses the ISR to service the node. Thus, Nelson uses "another structure" to traverse the hierarchical IST. Therefore, Applicants' arguments are not persuasive.

Further arguments are based upon previous arguments as addressed above, and are not persuasive for the same reasons.

### ***Claim Rejections - 35 USC § 101***

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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7. Claims 1-4 and 7-10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 is directed to a “system for use with a processor.” However, this system appears to be comprised of mere software elements that are interpreted as being a software system, per se. Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer. See, e.g., *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure’s functionality to be realized. In this case, a “condition management system *for use* with a processor” is recited. However, the claim language includes the phrase “for use” which indicates that the processor is not part of the system. Further claim elements are merely directed to software elements and do not include any statutory system elements. In contrast, claim 5 further limits the hierarchical register consolidation structure to be a hardware element (“interrupt register structure of said processor”) which is interpreted to provide a statutory system element permitting the data structure’s functionality to be realized. Claims 2-4, and 7-10 are dependent upon claim 1 but fail to provide any further statutory system elements. See MPEP 2106.01.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-3, 7-9, 11-13, and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,568,644 to Nelson et al. (hereinafter “Nelson”).

In regard to claim 1, Nelson discloses:

*A computer-implemented condition management callback system (see Fig. 2) for use with a processor employing a hierarchical register consolidation structure, comprising:*

*a condition management structure containing groups of status indicators associated with said hierarchical register consolidation structure logically abstracted into a tree of hierarchical container objects and element objects, each of said container objects associated with at least one of said element objects and linked to a single parent object, See Fig. 1A., also column 3 lines 9-15, e.g. “hierarchical tree.” Nelson provides an abstraction of a hierarchy used for managing interrupts.*

*each of said element objects representing at least one of said status indicators and linked to a single child object; Fig. 1A illustrates that each element is associated with a single set, or collection, of element objects. Further, see column 3 lines 44-51.*

*a callback abstraction subsystem configured to register a callback for one of said element objects and store logically abstracted data associated with said callback; and See column 3 lines 56-59, e.g. “handler ISR.”*

*an abstraction retrieval subsystem configured to employ said condition management structure to determine a condition of at least one of said status indicators by traversing said hierarchical register consolidation structure, See column 4 line 66 – column 5 line 2, e.g. “interrupt engine begins processing.”*

*initiate said callback based on said condition and pass said logically abstracted data if said one of said element objects representing said at least one of said status indicators has said callback registered. See column 3 lines 60-61, e.g. “handler ISR is invoked.”*

In regard to claim 2, the above rejection of claim 1 is incorporated. Nelson further discloses: *wherein said callback abstraction subsystem is further configured to register said callback for at least one of said container objects. See column 3 lines 58-59.*

In regard to claim 3, the above rejection of claim 2 is incorporated. Nelson further discloses: *wherein said abstraction retrieval subsystem is further configured to initiate said callback based on said element objects associated with said at least one of said container objects and pass said logically abstracted data. See column 3 lines 35-43.*

In regard to claim 7, the above rejection of claim 1 is incorporated. Nelson further discloses: *wherein said callback includes a function pointer, an application data pointer and a callback state. See column 3 lines 46, 61-64, and column 4 lines 3-5.*

In regard to claim 8, the above rejection of claim 1 is incorporated. Nelson further discloses: *wherein said callback includes control information for automatic enabling and disabling of said callback*. See column 4 lines 14-22.

In regard to claim 9, the above rejection of claim 1 is incorporated. Nelson further discloses: *wherein said callback abstraction subsystem is further configured to set an auto-disable flag associated with said callback and said abstraction retrieval subsystem is further configured to employ said auto-disable flag to cause said callback to be disabled from being initiated again after a first initiation*. See column 4 lines 25-28.

In regard to claim 11, Nelson discloses a method. See column 2 lines 57-59, e.g. “steps.” All further limitations have been addressed in the above rejection of claim 1.

In regard to claims 12, 13, and 17-19, the above rejection of claim 11 is incorporated. All further limitations have been addressed in the above rejections of claim 2, 3, and 7-9, respectively.

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



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11. Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson as applied to claims 1 and 11 above, and further in view of U.S. Patent 5,805,889 to Van De Vanter (hereinafter "Van De Vanter").

In regard to claim 4, the above rejection of claim 1 is incorporated. Nelson further discloses: *wherein said logically abstracted data is a ...message*. See column 5 lines 22-25. Nelson does not expressly disclose: *a text message*. However, Van DeVanter teaches that text messages are passed in the form of string arguments. See column 10 lines 65-67. It would have been obvious to one of ordinary skill at the time the invention was made, to use Van De Vanter's teaching of a string argument with Nelson's message in order to provide notification of the handler's name as suggested by Van De Vanter.

In regard to claim 14, the above rejection of claim 11 is incorporated. All further limitations have been addressed in the above rejection of claim 4.

12. Claims 5, 6, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson as applied to claims 1 and 11 above, and further in view of U.S. Patent 6,845,419 to Moyer (hereinafter "Moyer").

In regard to claim 5, the above rejection of claim 1 is incorporated. Nelson does not expressly disclose: *wherein said hierarchical register consolidation structure is a*

*hierarchical interrupt register structure of said processor and said status indicators are interrupt bits of registers within said hierarchical register consolidation structure.*

However, Moyer teaches that interrupt registers are used to hold status indicators as interrupt bits. See Abstract and Fig. 2. It would have been obvious to one of ordinary skill at the time the invention was made, to use Moyer's interrupt registers with Nelson's hierarchical register consolidation structure in order to provide a mechanism to determine pending interrupts as suggested by Moyer (see column 1 lines 36-41).

In regard to claim 6, the above rejection of claim 5 is incorporated. Nelson further discloses: *wherein said logically abstracted data contains information related to a type of interrupt.* See column 4 lines 19-22.

In regard to claims 15 and 16, the above rejection of claim 11 is incorporated. All further limitations have been addressed in the above rejection of claims 5 and 6, respectively.

13. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson as applied to claims 1 and 11 above, and further in view of U.S. Patent 4,768,149 to Konopik et al. (hereinafter "Konopik").

In regard to claim 10, the above rejection of claim 1 is incorporated. Nelson does not expressly disclose: *wherein said callback abstraction subsystem is further configured*

*to register multiple callbacks for said one of said element objects and store logically abstracted data for each of said callbacks.* However, Konopik teaches shared interrupts by multiple handlers that are registered to service a single interrupt using stored data. See column 6 lines 56-64. It would have been obvious to one of ordinary skill at the time the invention was made, to use Konopik's teaching of shared interrupts with Nelson's interrupt handlers in order to share a common interrupt line among a plurality of devices as suggested by Konopik (see column 5 lines 54-57).

In regard to claim 20, the above rejection of claim 11 is incorporated. All further limitations have been addressed in the above rejection of claim 10.

### ***Conclusion***

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. Derek Rutten whose telephone number is (571)272-3703. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571)272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/jdr/



**TUAN DAM  
SUPERVISORY PATENT EXAMINER**